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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,054

06/15/2005

Hiroshi Yokoyama

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EXAMINER

MATOCHIK, THOMAS L

ART UNIT

PAPER NUMBER

4134

MAIL DATE

DELIVERY MODE

10/31/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/539,054

Applicant(s)

YOKOYAMA ET AL.

Examiner

Thomas Matochik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/24/2006.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

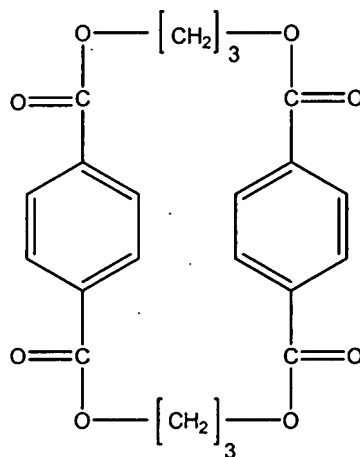
DETAILED ACTION***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3: A method for producing the polytrimethylene terephthalate (TPP) resin of claim 1, which comprises:

- (1) Providing a crude TPP resin in a molten form, said crude TPP comprising: 60 to 100 mole % of (a) TPP recurring units, and 0 to 40 mole % of (b) at least one monomer unit selected from the group consisting of monomer units obtained from co-monomers which are other than the monomers used for forming said TPP recurring units and which are copolymerizable with at least one of the monomers used for forming said TPP recurring units, the total molar amount of (a) monomer units and (b) monomer units being 100 mole %, said crude TPP resin further comprising a cyclic dimer shown in formula (1):



formula (1)

said crude TPP resin having an intrinsic viscosity $[\eta]$ of from 0.2 to 0.4 dl/g and a cyclic dimer formation index (E) being defined by the following formula (3):

$$E = W/M$$

Wherein M represents the terminal hydroxyl group content of said crude TPP resin in terms of mole % based on the total molar amount of the TPP

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unit, and W represents the reformation rate of the cyclic dimer in terms of an increase (as expressed by absolute percentage value) in the cyclic dimer content (% by weight), per minute, of the crude TPP resin as measured at 260°C in nitrogen gas atmosphere with respect to a sample of the crude TPP in a molten form, wherein the molten sample is obtained by melting cyclic dimmer-reduced sample has a cyclic dimmer content reduced to 0.1% by weight or less; and

(2) removing, from said crude TPP resin in a molten form, 0.5 % by weight or more, based on the weight of said crude TPP resin, of said cyclic dimmer, by volatilization under reduced pressure.

Claim 4: The method according to claim 3, wherein said crude TPP resin has a cyclic dimer formation index (E) of less than 0.033.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "E" in claims 3 and 4 is used by the claims to mean "a formation index for the terephthalate resin", while the accepted meaning is "a rate of formation." A rate is not a property of the compound rather it is a property of a process. Therefore the resin itself does not have a rate associated with it. The term is indefinite because the specification does not clearly redefine the term.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato et.al (WO 99/11709) using US 6,423,814 as English translation) and further using "The Encyclopedia of Polymer Science and Technology" as evidence.

Regarding claim 1: Kato teaches a polyester resin comprising 98 wt.% polytrimethylene terephthalate (PTT), 0.9 wt.% cyclic dimer and having an intrinsic viscosity of 1.1 dl/g and a b* value of 0.1 (Table I, Examples 1 and 8). The mw distribution is not stated. However, the molecular weight of a polyester is related to the intrinsic viscosity by the Mark-Houwink equation (Encyclopedia of Polymer Science and Technology, page 548, equation (1)) therefore the resin would meet the molecular weight limitation since it meets the intrinsic viscosity limitation.

Regarding claim 2: Kato teaches the resin can take the form of chips, fibers, plates or blocks (col. 10, lines 44-46) which in the broadest interpretation would encompass pellets. Crystallinity values are not stated. However, typical crystallinities for PTT range from 19% to 35% as evidenced by (Encyclopedia of Polymer Science and Technology, page 550, Crystal Structure). The office recognizes that all of the claimed effects and physical properties are not positively stated by the reference. Note however, that the reference teaches all of the claimed ingredients, process steps and process conditions and thus, the claimed effects and physical properties would implicitly be achieved by carrying out the disclosed process. If it is the applicants position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the examiner's position that the application contains inadequate

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disclosure in that there is no teaching as to how to obtain the claimed properties and effects by carrying out only these steps.

Regarding claim 3 and 4: Kato teaches a method of producing a PTT resin comprising (1) providing a melt phase resin, 260-280°C, (col. 8, lines 55-67 and col. 9, lines 1-5) having a purity of 98 wt.% polytrimethylene terephthalate, 0.9 wt.% cyclic dimer and having an intrinsic viscosity of 1.1 dl/g (Table I, Examples 1 and 8) and (2) Removing the cyclic dimer by 0.5 wt.% or more by volatilization under reduced pressure (col. 10, lines 45-55). Note that in Table I, Example 1 contains 2.4% cyclic dimer and Example 8, derived from Example 1, contains only 0.9% cyclic dimer, a drop of 1.5%. The cyclic dimer formation rate, E, is an adjustable parameter depending on the reaction temperature (col. 9, lines 1-5).

Regarding claim 7: Kato teaches a process for making PTT using a titanium catalyst (col. 9, lines 24-30) and a phosphoric acid (col. 6, lines 11-15). The ratio of phosphorous to titanium is between 0.4 to 3 (col. 6, lines 57-61).

Regarding claim 8: Kato teaches a process for making PTT using a tin catalyst (col. 2, lines 33-36).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato as applied to claims 1-4 and 7-8 above, and further in view of Okajima et.al (US 2003/0092874).

Regarding claim 5 and 6: Kato does not teach the removal of cyclic dimer as a continuous process. However, Okajima teaches a continuous solid phase polymerization process whereby PTT pellets are continuously fed into a heated vessel under vacuum in the presence of an inert gas (Example 1, ¶'s 0134-0139). The cyclic dimer content of the prepolymer pellets was 2.7% (¶ 0136). After solid state polymerization the cyclic dimer content was 0.8% (¶ 0139). Kato and Okajima are analogous art since they both are from the same field of endeavor, namely synthesis of polytrimethylene terephthalate (PTT) polymers. At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to use a continuous process to reduce the polymer's exposure to heat and reduce manufacturing costs.

Correspondence

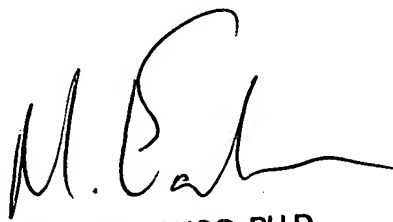
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Matochik whose telephone number is 571-270-3291. The examiner can normally be reached on Monday-Friday 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TLM
10/24/2007


MARK EASHOO, PH.D.
SUPERVISORY PATENT EXAMINER

30/04/07